ER60 Adaptive Logging (EAL) Instructions
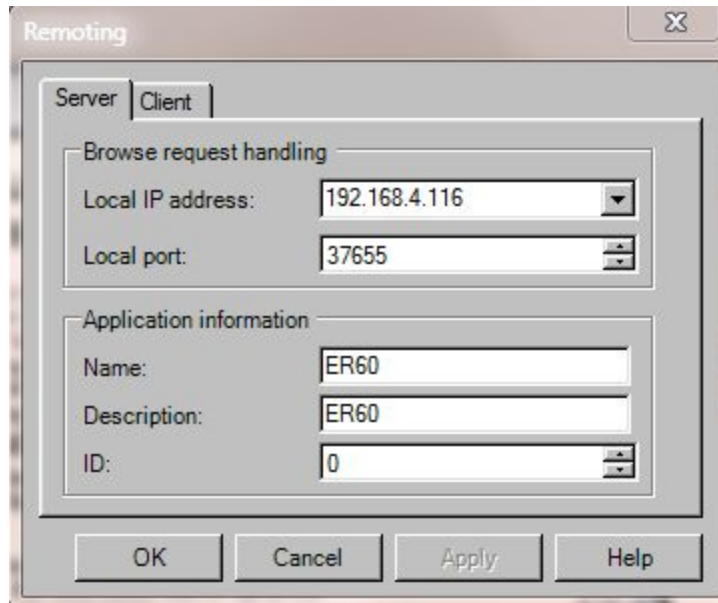
1. In the ER60, select **Install→Remoting**… In the Remoting Dialog box under the **Server** tab, use the pull-down menu next to **Local IP Address** and select the IP Address for the network card connected to the computer running the EAL program. Leave the **Local Port** number set to 37655.

2. Connect the computer running the ER60 Adaptive Logger (EAL) to the same network as the computer running the ER60, e.g. via network switch.
    a. To ensure that communication is possible, you can open up a command prompt (**Start→cmd**) and then type "ping xxx.xxx.xxx.xxx". In the above figure, the command would be "ping 192.168.4.116"). If communication is possible, the command prompt will show a number of successful replies from the target address:
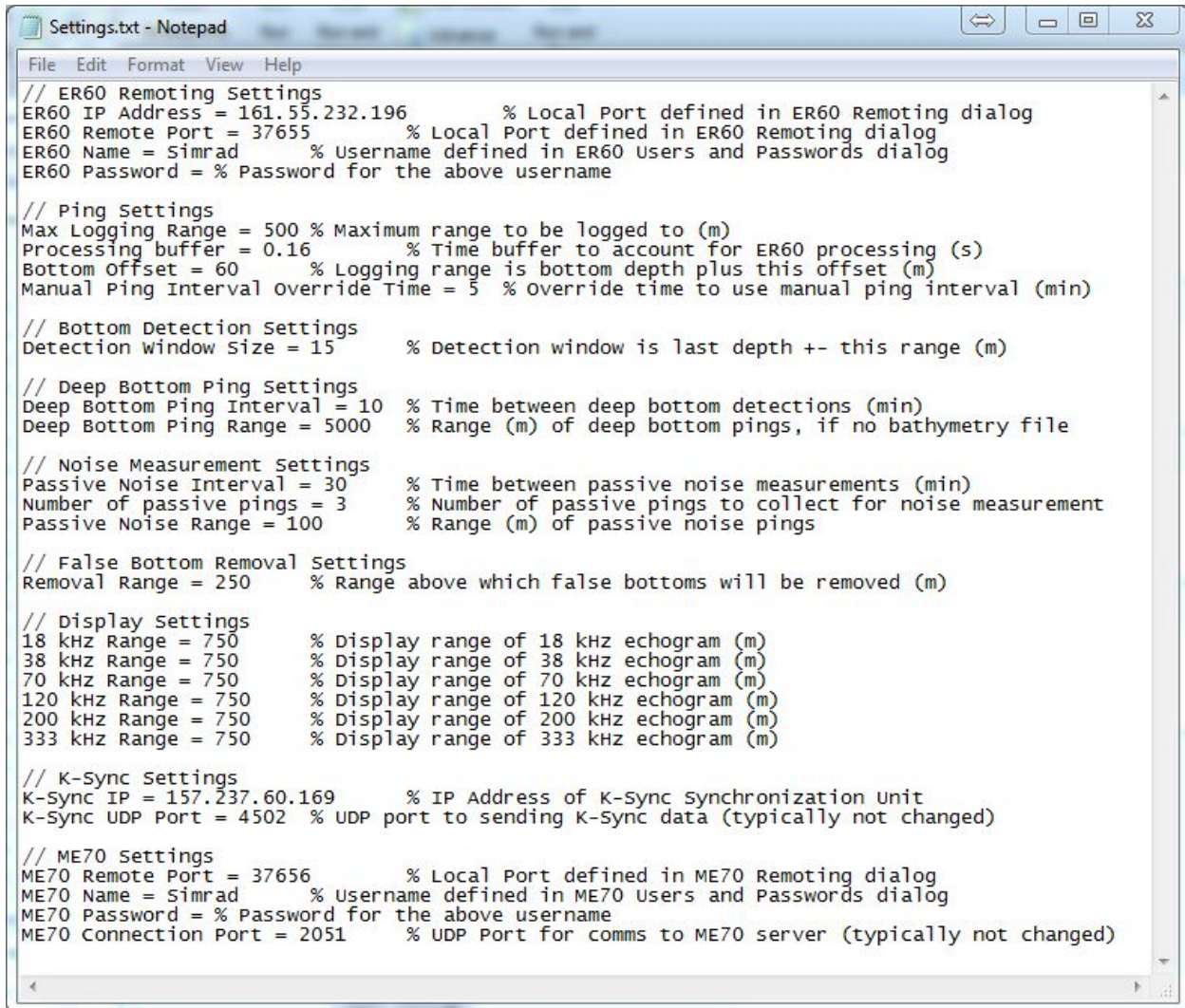
3. Open the m-file **EAL_20160120.exe**. The program may take a minute to open, after which the EAL GUI will appear:

4. Click the **Open Settings** button on the bottom-left of the GUI, after which a text file should appear with the program settings:

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Settings.txt - Notepad

File   Edit   Format   View   Help

// ER60 Remoting Settings
ER60 IP Address = 161.55.232.196          % Local Port defined in ER60 Remoting dialog
ER60 Remote Port = 37655           % Local Port defined in ER60 Remoting dialog
ER60 Name = Simrad        % Username defined in ER60 Users and Passwords dialog
ER60 Password = % Password for the above username

// Ping Settings
Max Logging Range = 500 % Maximum range to be logged to (m)
Processing buffer = 0.16          % Time buffer to account for ER60 processing (s)
Bottom Offset = 60        % Logging range is bottom depth plus this offset (m)
Manual Ping Interval Override Time = 5   % Override time to use manual ping interval (min)

// Bottom Detection Settings
Detection Window Size = 15         % Detection window is last depth +- this range (m)

// Deep Bottom Ping Settings
Deep Bottom Ping Interval = 10   % Time between deep bottom detections (min)
Deep Bottom Ping Range = 5000    % Range (m) of deep bottom pings, if no bathymetry file

// Noise Measurement Settings
Passive Noise Interval = 30        % Time between passive noise measurements (min)
Number of passive pings = 3        % Number of passive pings to collect for noise measurement
Passive Noise Range = 100          % Range (m) of passive noise pings

// False Bottom Removal Settings
Removal Range = 250        % Range above which false bottoms will be removed (m)

// Display Settings
18 kHz Range = 750         % Display range of 18 kHz echogram (m)
38 kHz Range = 750         % Display range of 38 kHz echogram (m)
70 kHz Range = 750         % Display range of 70 kHz echogram (m)
120 kHz Range = 750        % Display range of 120 kHz echogram (m)
200 kHz Range = 750        % Display range of 200 kHz echogram (m)
333 kHz Range = 750        % Display range of 333 kHz echogram (m)

// K-Sync Settings
K-Sync IP = 157.237.60.169         % IP Address of K-Sync Synchronization Unit
K-Sync UDP Port = 4502   % UDP port to sending K-Sync data (typically not changed)

// ME70 Settings
ME70 Remote Port = 37656           % Local Port defined in ME70 Remoting dialog
ME70 Name = Simrad        % Username defined in ME70 Users and Passwords dialog
ME70 Password = % Password for the above username
ME70 Connection Port = 2051        % UDP Port for comms to ME70 server (typically not changed)
```

5. While most of the parameters can remain at their default settings, the following typically need updating:

   a. **ER60 IP Address**: This is the IP Address found in Step 1, which is the IP of the network card in the ER60 computer to which the EAL computer connects.

   b. **Max Logging Range**: This is the maximum range for which data will be logged, i.e. if the seabed depth is greater than this range, the ER60 will only log to the Max Logging Range.

   c. **Removal Range**: The max range at which false bottoms will be removed. For example, if set to 250 m, false bottoms will be removed up to 250 m, but will not be removed beyond that. Typically this is set to the value of **Max Logging Range**.

6. Select the checkbox next to **Measure noise**. This will force the EAL to periodically place

the ER60 in passive mode to measure ambient noise, which also improves the bottom detection. Settings for the passive noise measurements can be found in the Settings.txt file.

7. If wanting to remove false bottoms, select the **Correct false bottom** checkbox. This will cause the EAL to select a ping rate which avoids false bottoms up to the **False Bottom Removal Range** defined in the Settings.txt file.
*NOTE: It is not necessary to load a bathymetry file. Bathymetry files are used to estimate the seabed depth when it is beyond the **Max Logging Range**, which is then used to select a ping rate which avoids false bottoms. When the seabed depth is shallower than the **Max Logging Range**, no bathymetry estimation is needed.

8. While the ER60 is pinging and operating, click the green **Start** button on the EAL GUI. Once connected, the program will begin displaying the detected seabed depth, logging range, ping interval, and time of the most recently analyzed ping. The Command Window will also display similar details with additional information.
   a. If the EAL program crashes and doesn't properly recover, exit the program, check the ER60 status (reboot if necessary), then restart the EAL. ***Please report any errors or warnings to Josiah.***

9. The following is a description of the parameters available on the EAL GUI:
   - **Measure noise** - Forces the ER60 to periodically place the transceivers in passive mode and collect ambient noise data, as defined in the Settings.txt file. These passive pings are saved in a separate .raw file named "NOISE."
   - **Check Deep Bottom** - When checked along with the "correct false bottoms" checkbox, and if the seabed depth is beyond the Maximum Logging Range, the EAL will periodically collect data to a deeper range (a "deep ping") in order to

obtain an up-to-date depth estimate, which it then uses until the next "deep ping" to try and remove false bottoms. Deep Bottom ping settings can be found in the Settings.txt file. If available, use of a bathymetry file is preferred over this method.

- **Unlock display range** - Typically the EAL takes control over the ER60, preventing the user from changing the echogram display range, logging range, ping mode, and ping interval. When this box is checked, the user has the ability to modify the echogram display range, which can be defined for each frequency in the Settings.txt file.

- **Set Ping Interval** - If the false bottom removal is not working well, or you simply wish to manually set the ER60 ping rate without having to stop the EAL, this checkbox will use the specified ping rate for the time specified in the "Manual Ping Interval Override Time" in the Settings.txt file. This option is not typically used.

- **K-Sync** - If a K-Sync is being used to synchronize transmissions between systems, the EAL can send it a pseudo-depth value in order to achieve varying ping rates (e.g. makes the ER60 act as master to all other systems). Parameters for communicating with the K-Sync are defined in the Settings.txt file.

- **ME70** - If checked, the EAL will connect to the ME70 and set the ME70 trigger delay so that the ME70 transmits directly after the ER60 logs data. For example, if the ER60 logs data to 100 m, the ME70 trigger delay will be set to 0.13 s (assuming c = 1500 m/s). Parameters for connecting to the ME70 can be found in the Settings.txt file.

- The text box below the **Start/Stop** button is for debugging purposes only. If the EAL crashes, it should automatically try to re-establish communication with the ER60 and restart itself. If it does this properly, then the text box will display "EAL restarted" but the program will continue to run.

10. While the EAL is running, the **Correct false bottom** checkbox can be selected/deselected at any time. If no bathymetry file is loaded, then false bottoms will only be removed if the seabed is detected and a false bottom would occur in the removal range. The status next to the checkbox will indicate if false bottoms are currently being removed.

11. To stop the EAL, click the red **Stop** button to stop and disconnect from the ER60. The ER60 will then revert to the Max Logging Range settings defined in the Settings.txt file.